

**WHAT IS CLAIMED IS:**

1. A noise determiner for use with a communications system,  
2 comprising:

3 a crosstalk identifier configured to detect directly a noise  
4 source in a frequency domain from observed noise associated with  
5 said communications system; and

6 a crosstalk estimator coupled to said crosstalk identifier and  
7 configured to provide a corresponding level of said noise source.

2. The noise determiner as recited in Claim 1 wherein said  
2 crosstalk identifier considers radio frequency interference.

3. The noise determiner as recited in Claim 1 wherein said  
2 crosstalk identifier considers unknown disturbers.

4. The noise determiner as recited in Claim 1 wherein said  
2 crosstalk identifier places said noise source into a modeling  
3 system selected from the group consisting of:

4 an American noise model,

5 an old European Technical Standards Institute (ETSI) noise  
6 model, and

7 a new ETSI noise model.

5. The noise determiner as recited in Claim 1 wherein said  
2 noise source has a power spectral density of a form  $P_N(f) =$   
3  $g(k) P_B(f)$ .

6. The noise determiner as recited in Claim 1 wherein said  
2 noise source is a noise selected from the group consisting of:  
3 Additive White Gaussian Noise,  
4 Digital Subscriber Line (DSL) Near-End Crosstalk (NEXT),  
5 High Bit-Rate DSL (HDSL) NEXT,  
6 T1 NEXT, and  
7 European Technical Standards Institute (ETSI) defined noise.

7. The noise determiner as recited in Claim 1 wherein said  
2 communications system is a digital subscriber line (DSL) system.

8. A method of determining noise in a communications system,  
2 comprising:

3 directly detecting a noise source in a frequency domain from  
4 observed noise associated with said communications system; and  
5 providing a corresponding level of said noise source.

9. The method as recited in Claim 8 wherein said detecting  
2 includes considering radio frequency interference.

10. The method as recited in Claim 8 wherein said detecting  
2 includes considering unknown disturbers.

11. The method as recited in Claim 8 wherein said detecting  
2 includes placing said noise source into a modeling system selected  
3 from the group consisting of:

4 an American noise model,  
5 an old European Technical Standards Institute (ETSI) noise  
6 model, and  
7 a new ETSI noise model.

12. The method as recited in Claim 8 wherein said noise  
2 source has a power spectral density of a form  $P_N(f) = g(k) P_B(f)$ .

13. The method as recited in Claim 8 further including  
2 selecting said noise source from the group consisting of:

3 Additive White Gaussian Noise,

4 Digital Subscriber Line (DSL) Near-End Crosstalk (NEXT),

5 High Bit-Rate DSL (HDSL) NEXT,

6 T1 NEXT, and

7 European Technical Standards Institute (ETSI) defined noise.

14. The method as recited in Claim 8 wherein said  
2 communications system is a digital subscriber line (DSL) system.

15. A digital subscriber line (DSL) modem, comprising:

2 a front end coupled to a DSL channel;

3 a transmitter coupled to said front end that processes a  
4 digital signal for analog transmission over said channel; and

5 a receiver coupled to said front end that converts an analog  
6 signal received over said channel to a digital signal; and

7 a noise determiner, including:

8 a crosstalk identifier that detects directly in a  
9 frequency domain a noise source from observed noise associated with  
10 said channel; and

11 a crosstalk estimator coupled to said crosstalk  
12 identifier that provides a corresponding level of said noise  
13 source.

16. The DSL modem as recited in Claim 15 wherein said  
2 crosstalk identifier considers radio frequency interference.

17. The DSL modem as recited in Claim 15 wherein said  
2 crosstalk identifier considers unknown disturbers.

18. The DSL modem as recited in Claim 15 wherein said  
2 crosstalk identifier places said noise source into a modeling  
3 system selected from the group consisting of:

4 an American noise model,  
5 an old European Technical Standards Institute (ETSI) noise  
6 model, and  
7 a new ETSI noise model.

19. The DSL modem as recited in Claim 15 wherein said noise  
2 source has a power spectral density of a form  $P_N(f) = g(k) P_B(f)$ .

20. The DSL modem as recited in Claim 15 wherein said noise  
2 source is a noise selected from the group consisting of:

3 Additive White Gaussian Noise,  
4 Digital Subscriber Line (DSL) Near-End Crosstalk (NEXT),  
5 High Bit-Rate DSL (HDSL) NEXT,  
6 T1 NEXT, and  
7 European Technical Standards Institute (ETSI) defined noises.

21. The DSL modem as recited in Claim 15 wherein said DSL  
2 modem is an Asymmetric DSL modem.